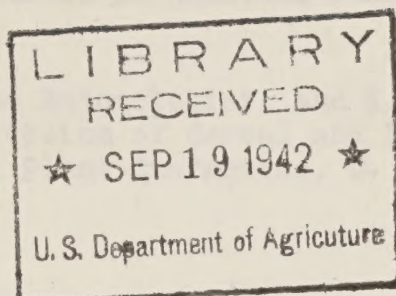


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April 1936



REPORT ON ESTIMATES OF DAMAGE BY THE EUROPEAN CORN BORER IN 1935
INCLUDING LOSSES IN SELECTED SWEET CORN FIELDS

Division of Cereal and Forage Insects
Bureau of Entomology and Plant Quarantine
U. S. Department of Agriculture

European Corn Borer Research

REPORT ON ESTIMATES OF DAMAGE BY THE EUROPEAN CORN BORER IN 1935

INCLUDING LOSSES IN SELECTED SWEET CORN FIELDS

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Special surveys of European corn borer infestation in sweet corn grown for market, canning, and seed purposes were conducted during the 1935 season, the data from which, together with those from the general fall infestation survey on all types of corn, have been utilized in reaching estimates of financial damage caused by the insect. These investigations were directed from the laboratory for European corn borer research at Toledo, Ohio, W. A . Baker in charge. Helpful cooperation in the work was given to the Bureau by farmers, market gardeners, canners, and seedsmen, and active assistance was supplied by the State Departments of Agriculture in Maine, Vermont, and Indiana.

Damage to Market Sweet Corn

A survey of corn-borer infestation in early market sweet corn was conducted in several districts of both the Lake States and Eastern States areas. This survey was designed to show primarily the type of higher infestations experienced in a particular year by individual growers of this crop, thereby supplementing the more general infestation data procured later in the season on an area-wide basis. The usual type of examinations were made, therefore, in selected fields carrying relatively high borer populations and the figures shown represent results obtained in this way rather than averages in which all fields, regardless of concentrations of borer populations, are included. The nature of the latter data, averaging out high and low populations as they do, restricts a presentation of the entire picture of borer infestations essential to a complete understanding of all phases of the problem.

Estimates of the production of the fields surveyed were obtained by multiplying the acreage of each by an average yield of 800 dozen ears per acre. The current price received by the farmer for his corn was then applied to the production of each field and the resultant figures totaled to show the value of the crop for all of the surveyed fields in a district. In the calculation of loss by the borer, a damage index of 8.8 percent loss per borer per plant, the value established after several years of plot experimentation by other workers at Toledo, Ohio, was applied to the average borer population for each district. The crop loss by borer per acre in dollars was then estimated on the basis of such data. A summary of the data appears in table 1.

The heaviest corn-borer infestation found in early market sweet corn, in the Lake States area in 1935, appeared in Lucas county, Ohio, in the general vicinity of Toledo, where the average number of borers per 100 plants was 327.9. Rather heavy borer populations were observed in some of the sweet corn in this district, all but one of the 25 surveyed fields containing an average of more than 100 borers per 100 plants and each of 9 fields having an average of over 400 borers per 100 plants. Only a light infestation occurred in 1935, in the Wayne county, Mich., district, which supplies much of the sweet corn for the Detroit market. In western New York, the corn borer apparently was not particularly injurious to market sweet corn in 1935.

In the Eastern States area, the most severe infestation to early sweet corn (by the first-generation borer), in 1935, was found in the districts of New Haven, Conn. and Bristol, Mass. - Newport, R.I., in which the average numbers of borers per 100 plants were 675 and 385.3, respectively. Five of the fields surveyed in these districts had average populations of over 1000 borers per 100 plants, with a maximum of 1,460 in one field. Relatively high infestations were found in other districts of New England, and in the Monmouth-Ocean County, N.J. district the average population was found to have reached 24.5 borers per 100 plants.

The estimates given in table 1 place the value of the crop at \$49,600 for the 388 acres of market sweet corn surveyed in the Lake States area, and at \$111,647 for the 866.5 acres surveyed in the Eastern States area, or a total of \$161,247.

Estimated loss by the borer per acre of market sweet corn, surveyed in 1935, varied from as low as \$1.05 (based on a calculated loss of 0.82 percent) in Wayne county, Mich., to as high as \$133.77 (based on a calculated loss of 59.4 percent) in New Haven county, Conn. The per-acre loss in the Lake States area was estimated as \$14.77 and in the Eastern States area as \$55.63, or an average of \$40.77 for the combined surveyed districts of both areas. In the former area, the greatest crop loss (28.86 percent) occurred in Lucas county, Ohio, and in the latter, the most pronounced crop losses (59.4 and 33.91 percent, respectively) were in New Haven county, Conn. and in Bristol, Mass. - Newport, R.I. counties. The average crop loss for the combined districts surveyed in both areas was practically 19 percent.

Damage to Canning Sweet Corn

Rather comprehensive field surveys of corn-borer infestation, in sweet corn grown for canning purposes, were conducted during August and September 1935, in important corn-canning districts within the infested portions of Maine, New Hampshire, Vermont, New York, and Ohio. The procedure in this investigation was to interview the canner and to obtain from him certain data, including the names and locations of a number of his growers in whose fields corn-borer infestation had been noted in previous years or during the current season, and in which a survey of this year's infestation could be made. In some sections where little infestation existed, the fields were selected on the basis of early plantings. The survey, therefore, included fields which fell within the upper limits of corn-borer infestation in the general locality of each canning factory, and represented, on that basis, the maximum degree of damage confronting the contract growers and canners in 1935.

Table 1. - Infestation and estimated damage by corn borer in market sweet corn in 1935

District *	Period of survey	Number of fields surveyed	Number of acres surveyed	Average number of borers per 100 plants	Calculated percent loss by borer	Estimated crop value in dollars	Estimated crop loss by borer per acre in dollars
Lake States area							
Lucas, Ohio	Jul. 23-Aug. 9	25	119.0	327.9	28.86	16,396.00	39.76
Wayne, Mich.	Aug. 6-10	20	77.3	9.3	.82	9,886.40	1.05
Monroe, N.Y.	Aug. 5-8	25	147.0	63.6	5.60	18,184.00	6.93
Wayne, N.Y.	Aug. 8-10	25	44.7	112.3	9.88	5,133.60	11.33
Totals and averages		95	388.0	128.3	11.29	49,600.00	14.77
Eastern States area (First generation)							
York, Maine	Aug. 6-10	25	45.0	117.3	10.32	10,320.00	23.67
Middlesex-Essex, Mass.	Jul. 30-Aug. 2	25	164.0	288.3	25.37	32,104.00	49.66
Bristol, Mass.-Newport, R.I.	" 22-26	25	102.0	385.3	33.91	25,936.00	86.22
Hartford, Conn.	" 30-Aug. 2	25	37.1	225.2	19.82	10,241.60	54.74
New Haven, Conn.	" 22-30	25	35.9	675.0	59.40	8,096.04	133.77
Suffolk, N.Y.	" 23-26	20	50.6	144.5	12.72	14,368.00	36.12
Monmouth-Ocean, N.J.	" 22-27	25	43.9	24.5	2.16	10,580.80	5.21
Totals and averages		170	478.5	265.7	23.39	111,647.44	55.63
Grand totals and averages		265	866.5	215.7	18.99	161,247.44	40.77

* Limited to portions of named counties.

A total of 33 canning factories in operation this year were visited in the combined States (13 in Maine and New Hampshire, 4 in Vermont, 15 in New York, and 1 in Ohio). These factories had contracted for a total of 16,925 acres of sweet corn, comprised of 29 varieties, and produced by 3,363 growers. Of this contracted production, 1,648 acres (or 9.7 percent) were included in the 176 fields surveyed for corn-borer infestation.

The usual survey methods were employed to determine the average borer populations in the fields. The percent of loss by the borer was then calculated by applying to the district averages a damage index of 4.6 percent loss per borer per plant previously established by other workers as a result of detailed plot experiments at Toledo, Ohio. The average prices and yields for the respective canning districts were used in the estimation of crop values and losses.

The estimated yields of graded ears of canning corn in surveyed fields varied in the different districts as follows: In Maine, the average was 4.4 tons per acre, with a minimum of 1.7 and a maximum of 6.9; in New Hampshire, the average was 3.6 tons per acre, with a minimum of 2 and a maximum of 6; in Vermont, the average was 3.6 tons per acre, with a minimum of 1 and a maximum of 6; in New York, the average was 3.1 tons per acre, with a minimum of 1 and a maximum of 5.5; and in Ohio, the average was 2.7 tons per acre, with a minimum of 2 and a maximum of 3.5.

The average prices, paid in 1935, for canning corn in the several districts were as follows: Maine - \$16.20 per ton of graded ears (calculated on the basis of 2.25 cents per pound paid for 720 pounds of cut corn equivalent to about 36 percent of the total weight of corn in the husks); New Hampshire - \$15.00 per ton of graded ears; Vermont - \$10.75 per ton of snapped ears (with a minimum of \$10.50 and a maximum of \$11.00); New York - \$15.50 per ton of graded ears (with a minimum of \$14.50 and a maximum of \$17.50); and Ohio - \$9.00 per ton of graded ears.

The data procured in the survey, together with estimates of loss by the borer, are summarized in table 2. These data and more detailed figures not shown in the table may be discussed briefly. In Maine the heaviest infestation was found near Fryeburg in Oxford county, where 7 of the 46 fields surveyed had populations between 101.2 and 254.2 borers per 100 plants. No other field surveyed in Maine, or in New Hampshire, contained more than 85 borers per 100 plants. The maximum number of borers per 100 plants noted in any one of the 40 fields surveyed in northern Vermont was 226.8 in Jericho in Chittenden county. Four other fields in the same county had populations of 166.6, 145.7, 133.4, and 107.5 borers per 100 plants, respectively, while the remaining 35 fields each contained an average of less than 100 borers per 100 plants. Corn-borer infestation, in western New York in 1935, exceeded an average of 100 borers per 100 plants in only 2 of the 75 fields surveyed in that district. These two fields had populations of 120 and 111.6 borers per 100 plants, respectively. The three fields of canning corn showing highest borer infestation among the 15 surveyed in Ohio contained populations of 234, 148.2, and 109.2 borers per 100 plants, respectively. Each of the remaining 12 fields had fewer than 70 borers per 100 plants.

The estimated losses caused by the borer per acre of canning sweet corn surveyed in different districts in 1935, as shown in table 2, varied from \$0.54 (1.12 percent) to \$1.41 (2.28 percent) and averaged \$0.88 (2.07 percent). Infestation in some individual fields, however, was sufficient to result in crop losses calculated as high as 10 percent.

Table 2. - Summary of survey data taken in fields of canning sweet corn in 1935, and estimates of loss by European corn borer

State	No. fields examined	Acreage of fields	Average percent plants infested by borer	Average number borers per 100 plants	Calculated percent loss by borer	Estimated loss by borer per acre in dollars*
Maine and)						
New Hampshire)	46	210	19.0	44.6	2.05	1.41
Vermont	40	422	20.9	49.5	2.28	.88
New York	75	895	8.7	24.4	1.12	.54
Ohio	15	121	23.8	61.0	2.81	.68
Totals and averages	176	1648	18.1	44.9	2.07	.88

* Based on average yields and price for each State district.

Damage to Seed Sweet Corn in Connecticut

During September, a brief survey was conducted in central and southern Connecticut to determine the losses resulting from corn-borer damage to seed sweet corn. In the past three years certain data have been taken on borer damage to this crop by an examination of the racked and drying ears. The application of this method gave an estimate of the damage present in the ears in the drying racks but did not take into consideration the reduction of yield resulting from borer injury to the growing plants. As a result of intensive plot experiments, conducted in 1934 and 1935, by other workers at Toledo, Ohio, there has been established a generalized damage index for seed sweet corn which can be applied to average field populations of the borer for the purpose of estimating losses. This index figure, which is expressed as a 5.9 percent loss per borer per plant, has been used in the calculation of borer losses to seed sweet corn considered in this report.

The seed sweet corn surveyed in 1935, was produced by 20 different growers, under contract to eight seed companies, and was well distributed over the seed-corn growing districts of New Haven and Hartford counties, Connecticut. Fifty-one fields, comprising a total of 306 acres and representing 35 varieties of sweet corn, were examined for corn-borer infestation just prior to harvest. The usual survey methods were employed.

For purposes of calculating the crop value and the losses from corn-borer damage, an average yield per acre of 1,680 pounds of shelled salable sweet corn seed was established. This figure was derived from data compiled and made available by various seed companies in Connecticut and represents the average yield for a five-year period prior to noticeable corn-borer damage to the crop. In the figure are included a large number of varieties grown by the seed companies during that time. The price of seed sweet corn grown under contract, in Connecticut in 1935, ranged from 4 to 11 cents per pound, the average being 6 cents per pound.

A summary of the data obtained during the survey of the 51 fields is given in table 3. Plant infestation ranged from 63 to 100 percent and averaged 88.8 percent; the average number of borers per infested plant varied from 1.6 to 13.8 and averaged 5.6; and the borer populations ran from 131.2 to 1,338.6 per 100 plants and averaged 512.8. Of the 51 fields surveyed, 4 (or 7.8 percent) had populations of over 1,000 borers per 100 plants and 23 (or 45.1 percent) showed averages of over 500 borers per 100 plants. Although the purpose of this survey was to show damage in fields selected because of relatively high infestation, only 6 of 57 fields encountered in the work, were excluded because of plant infestation below 60 percent. Actually, the infestation and borer populations in the fields surveyed were typical of those found in the same general regions during the fall infestation survey in which the cornfields were taken at random.

The production of shelled seed corn from the total 306 acres included, in the fields surveyed in 1935, has been estimated at 514,080 pounds, with a value of \$30,844.80. The crop loss as a result of corn-borer damage has been estimated at an average of 508 pounds of seed per acre, or a total of 155,448 pounds. The estimated average money loss per acre was \$30.43, or a total of \$9,311.58, equivalent to approximately 30 percent of the expected return. Increased labor costs involved in the processing of damaged corn have not been included in these estimates.

Most of the seed sweet corn grown in the fields surveyed this year was planted from May 2 to June 5, with about 50 percent of the fields being planted during the second and third weeks of May. Three fields were planted later in June and one field not until July 28. Some corn planted as late as June 21 matured in the field but most varieties planted after that date failed to mature sufficiently for seed purposes. Differences in the planting dates were not reflected in the degree of corn-borer infestation in Connecticut this year.

seed

Table 3. Data taken in fields of sweet corn in Connecticut surveyed just prior to harvest, and estimates of damage caused by the European corn borer,* 1935.

Field No.	Variety of corn	No. acres	Planting date	Average percent plants infested by borer	Average number borers per infested plant	Average number borers per 100 plants	Calculated percent loss by borer	Estimated loss by borer per acre	
								In pounds of shelled corn	In dollars
1	Kansas Cross	3	May 10	85.0	4.0	340.0	20.06	337	20.22
2	Purdue 39	20	6	73.0	1.9	138.8	8.14	137	8.22
3	Purdue 51	6	6	96.0	9.3	892.8	52.68	885	53.10
4	Whipple's Inbred	3	14	89.0	3.0	267.0	15.75	265	15.90
5	Early Sensation	5	June 4	63.0	4.1	258.3	15.24	256	15.36
6	Early Bantam	3	May 30	80.0	3.7	296.0	17.46	293	17.58
7	Spanish Gold	5	June 4	90.0	8.9	801.0	47.26	794	47.64
8	Improved Howling Mob	5	May 25	81.0	5.7	461.7	27.24	458	27.48
9	Narrow Grain Evergreen	6	15	79.0	1.8	142.2	8.39	141	8.46
10	Early Evergreen	7	June 4	93.0	4.4	409.2	24.14	406	24.36
11	Evergreen Inbred	5	May 2	90.0	6.6	594.0	35.05	589	35.34
12	Florida 191	2	2	84.0	3.8	319.2	18.83	316	18.96
13	Whipcross 39-6	5	15	83.0	4.1	340.3	20.08	337	20.22
14	Burpee's Early Market	1	25	100.0	6.5	650.0	38.35	644	38.64
15	Whipple's Yellow	2	25	97.0	6.2	601.4	35.48	596	35.76
16	Evergreen Inbred	15	10	87.0	3.9	339.3	20.02	336	20.16
17	Florida 191	5	10	82.0	1.6	131.2	7.74	130	7.80
18	Spanish Gold	4	June 21	98.0	8.2	803.6	47.41	796	47.76
19	Connecticut 2	1	1	97.0	13.8	1338.6	78.98	1327	79.62
20	C-13 Early Market	2	10	98.0	7.2	705.6	41.63	699	41.94
21	Cross Leman's and Maule	2	5	95.0	6.8	646.0	38.11	640	38.40
22	Country Gentleman	8	1	96.0	8.3	796.8	47.01	790	47.40
23	Bantam Evergreen	3	July 28	97.0	5.0	485.0	28.62	481	28.86
24	Purdue 51	3	May 20	95.0	7.1	674.5	39.80	669	40.14
25	Purdue 39	12	June 1	74.0	3.0	222.0	13.10	220	13.20
26	Whipple's Yellow	4	May 15	97.0	11.7	1134.9	66.96	1125	67.50
27	Purdue 39	2	June 1	91.0	6.3	573.3	33.82	568	34.08
28	Top Cross Country Gentleman	40	May 20	79.0	3.0	237.0	13.98	235	14.10

Table 3 continued.

Field No.	Variety of corn	No. acres	Planting date	Average percent plants infested by borer	Average number borer per infested plant	Average number borer per 100 plants	Calculated percent loss by borer	Estimated loss of In pounds of shelled corn	Estimated loss by borer per acre In dollars
29	Country Gentleman	12	May 17	75.0	4.5	337.5	19.91	334	20.04
30	Country Gentleman 424	18	11	90.0	4.0	360.0	21.24	357	21.42
31	Country Gentleman 419	6	11	84.0	4.3	361.2	21.31	358	21.48
32	Red Evergreen	12	15	94.0	6.0	564.0	33.28	559	33.54
33	Evergreen 77	3	15	82.0	3.0	246.0	14.51	244	14.64
34	Crosby 48	1	25	99.0	11.6	1148.4	67.76	1138	68.28
35	Asgrow Golden Colonel	16	16	77.0	4.7	361.9	21.35	359	21.54
36	Whipple's 6	1	16	91.0	5.7	518.7	30.60	514	30.84
37	Whipple's 2	1	16	100.0	9.8	980.0	57.82	971	58.26
38	Purdue 39	8	8	96.0	7.7	739.2	43.61	733	43.98
39	Purdue 51	2	8	98.0	7.4	725.2	42.79	719	43.14
40	Long Island Beauty	4	12	85.0	6.0	510.0	30.09	506	30.36
41	Country Gentleman	9	12	70.0	5.1	357.0	21.06	354	21.24
42	Late Mammoth	1	6	99.0	10.2	1009.8	59.58	1001	60.06
43	Long Island Beauty	4	6	97.0	5.9	572.3	33.77	567	34.02
44	Golden Early Market	3	21	97.0	6.5	630.5	37.20	625	37.50
45	Purdue 39	7	11	86.0	1.8	154.8	9.13	153	9.18
46	Purdue 51	2	11	99.0	4.6	455.4	26.87	451	27.06
47	Stowell's Evergreen	6	6	99.0	4.6	455.4	26.87	451	27.06
48	Golden Giant	2	6	92.0	2.7	248.4	14.66	246	14.76
49	Country Gentleman	5	20	80.0	3.4	272.0	16.05	270	16.20
50	Bantam Evergreen	2	16	81.0	2.9	234.9	13.86	233	13.98
51	Stowells Evergreen	2	10	91.0	3.4	309.4	18.25	307	18.42
Total 35 varieties		306		88.8	5.6	512.8	30.25	508	30.43
Averages									

* A damage index of 5.9 percent loss per borer per plant was applied to the average borer populations to obtain the calculated percent loss. An average yield of 1680 pounds of shelled corn per acre and an average price of 6 cents per pound were used in computing the estimated loss per acre.

Area-Wide Estimates of Damage

Estimates of damage caused by the borer in 1935 to field and fodder corn combined, and to sweet corn, over a large portion of the older infested territory have been prepared according to the method used for this purpose during the past three years. These are summarized in tables 4 and 5 and compared with similar data for 1932, 1933, and 1934 in table 6. Such estimates must necessarily be approximate and, in general, more indicative than factual. Further, the data in table 6 should also be considered applicable only to those portions of infested territory comprised of counties or county groups for which comparable infestation data for the four years mentioned are available.

In the calculations, damage indices of 3 percent loss per borer per plant in the case of the combined field and fodder corn, and of 8 percent for sweet corn, were applied to the average borer populations per county or county group, as determined from the fall infestation survey, to give percentages of loss for infestations of varying intensity. The indices used are expressive, in whole numbers, of the rates of damage established by other workers as a result of detailed plot experimentation at Toledo, Ohio. The same average borer population figures were utilized for the different types of corn. Crop production figures were derived from information given in the Fifteenth Agricultural Census (1930). For the purpose of this study, the production of fodder corn was calculated in bushels and combined with the field corn. The two crops were then considered as one and given the same per-bushel money value. Estimates of sweet corn production were obtained by multiplying the county acreages of this crop given in the census by an average yield of 800 dozen ears per acre. The estimated borer damage in dollars was then computed from the figures on crop value and the calculated percent loss by the insect.

The valuation of the field and fodder corn crop in comparable territory and consequent money losses caused by the borer for the years 1932, 1933, and 1934, shown in table 6, represent a revision of figures given on this subject in the "Report on Estimates of Damage Caused by the Corn Borer in 1934" issued in May 1935. The revised figures, together with calculations on field and fodder corn for 1935, are based on the United States crop-year average prices per bushel of corn given in a report entitled "Average Prices Received by Farmers for 1935 Crops, with Comparisons" issued December 20, 1935, by the Bureau of Agricultural Economics. These prices, which replace the average price per bushel of corn received by producers on December 1 previously furnished by the above Bureau, are as follows: 1932 - 31.8 cents; 1933 - 52.2 cents; 1934 - 81.6 cents; and 1935 - 57.7 cents (preliminary). In the case of sweet corn the calculations for 1932, 1933, and 1934 in table 6 remain the same. The prices per dozen ears of sweet corn utilized in the 1935 estimates are as follows: For Michigan, Ohio, and Indiana - 12 cents (Based on daily quotations supplied by the Toledo Gardeners Co-operative Association, Toledo, Ohio); for western New York and Pennsylvania - 12 cents (Based on Buffalo quotations furnished by the State Department of Agriculture and Markets, Buffalo, N.Y.); for New England (except Connecticut) - 18 cents (Based on Boston quotations supplied by the State Department of Agriculture, Boston, Mass.); for Connecticut, Long Island, New Jersey, Maryland, and Virginia - 17 cents (Based on Connecticut quotations furnished by the State Department of Agriculture, Hartford, Conn.)

The total loss from the corn borer in all of the infested territory surveyed in 1935, comprising about 3,500,000 acres with a crop production valued at approximately \$76,900,000, was estimated at \$1,193,465. This loss was divided as follows: Field and fodder corn, \$554,829 (46.5 percent) and sweet corn \$638,636 (53.5 percent).

In the Lake States area, the loss to field and fodder corn in 1935 was estimated at \$455,033 (85.6 percent of entire loss in this area) and to sweet corn, at \$76,724 (14.4 percent), or a total of \$531,757.

In the Eastern States area, the loss to field and fodder corn in 1935 was estimated at \$99,796 (15.1 percent of entire loss in this area) and to sweet corn at \$561,912 (84.9 percent), or a total of \$661,708.

The calculated percent loss in the corn crop varies directly with the intensity of infestation (average number of borers per 100 plants). In 1935 this reached a maximum in both types of corn in the central and southern part of Connecticut and on the eastern two-thirds of Long Island, N.Y. The greatest estimated money losses per county unit also occurred in these sections. The surveyed portion of Ohio showed a greater total loss (\$348,203) in 1935 than did any other State region.

Corn-borer damage in either the Lake States or Eastern States area in 1935, on the basis of data from comparable territory as shown in table 6, was greater than in any one of the previous three years, and for the combined two areas, the loss in 1935 was 81.5 percent greater than in 1934. This was the case even though the average price per bushel of field corn in 1935 was 24 cents lower than in 1934.

The per-acre loss continued to be higher in sweet than in field and fodder corn in both areas and greater for each or all types of corn in the Eastern States than in the Lake States area. The estimated average crop losses in dollars per acre caused by the corn borer in the territory considered in table 6 for different years are as follows:

	<u>1932</u>	<u>1933</u>	<u>1934</u>	<u>1935</u>
Lake States area				
Field and fodder corn	0.13	0.18	0.13	0.22
Sweet corn	3.56	2.87	1.58	2.37
Eastern States area				
Field and fodder corn	0.73	2.08	2.07	3.74
Sweet corn	15.05	26.60	21.54	41.17

Table 4. Statistics on estimated production and value of field and fodder corn, and of sweet corn, in counties, and for State regions, surveyed in 1935.

Lake States Area					
State and County or County Group	Bushels of field and fodder corn	Dozen ears of sweet corn	Estimated value of crop in dollars		
			Field and fodder corn	Sweet corn	Total
<u>Michigan</u>					
Lenawee	2,185,623	218,400	1,261,104	26,208	1,287,312
Macomb	349,325	304,800	201,561	36,576	238,137
Monroe	1,771,569	1,130,400	1,022,195	135,648	1,157,843
St. Clair	315,492	155,200	182,039	18,624	200,663
Washtenaw	1,047,790	551,200	604,575	66,144	670,719
Wayne	317,039	2,023,200	182,932	242,784	425,716
Genesee-Huron-Sanilac-					
Tuscola	1,773,560	578,400	1,023,344	69,408	1,092,752
Hillsdale-Ingham-					
Jackson	2,192,619	540,000	1,265,141	64,800	1,329,941
Lapeer-Livingston-					
Oakland	1,009,749	481,600	582,625	57,792	640,417
Totals	10,962,766	5,983,200	6,325,516	717,984	7,043,500
<u>Indiana</u>					
Adams-Blackford-Jay-					
Wells	4,141,168	115,200	2,389,454	13,824	2,403,278
Allen-DeKalb-Steuben	4,126,771	274,400	2,381,147	32,928	2,414,075
Delaware-Henry-Randolph-					
Wayne	8,175,115	388,000	4,717,041	46,560	4,763,601
Huntington-Noble-					
Whitley	4,212,810	70,400	2,430,791	8,448	2,439,239
Totals	20,655,864	848,000	11,918,433	101,760	12,020,193

Table 4 continued.

Table 7 continued.

Lake States Area

State and County or County Group	Bushels of field and fodder corn	Dozen ears of sweet corn	Estimated value of crop in dollars		
			Field and fodder corn	Sweet corn	Total
<u>Ohio</u>					
Defiance	1,426,148	60,800	822,887	7,296	830,183
Fulton	1,850,039	198,400	1,067,473	23,808	1,091,281
Hancock	2,481,693	28,000	1,431,937	3,360	1,435,297
Henry	2,494,776	124,000	1,439,486	14,880	1,454,366
Lucas	911,224	1,735,200	525,776	208,224	734,000
Ottawa	778,116	69,600	448,973	8,352	457,325
Paulding	1,837,375	102,400	1,060,165	12,288	1,072,453
Putnam	2,437,268	31,200	1,406,304	3,744	1,410,048
Sandusky	1,875,413	823,200	1,082,113	98,784	1,180,897
Seneca	2,361,516	108,000	1,362,595	12,960	1,375,555
Williams	1,269,920	23,200	732,744	2,784	735,528
Wood	3,597,573	98,400	2,075,800	11,808	2,087,608
Allen-Auglaize-Mercer-					
Van Wert	7,641,186	282,400	4,408,964	33,888	4,442,852
Ashland-Knox-Morrow-					
Richland	4,091,986	196,800	2,361,076	23,616	2,384,692
Champaign-Darke-Logan-					
Miami-Shelby	10,866,242	648,000	6,269,822	77,760	6,347,582
Clark-Fayette-Greene-					
Madison-Montgomery	12,285,305	4,494,400	7,088,621	539,328	7,627,949
Crawford-Wyandot	3,082,772	44,800	1,778,759	5,376	1,784,135
Delaware-Hardin-Marion-					
Union	7,143,465	570,400	4,121,779	68,448	4,190,227
Erie-Huron-Lorain	2,163,499	4,261,600	1,248,339	511,392	1,759,731
Medina-Portage-Stark-					
Summit-Wayne	3,752,333	1,317,600	2,165,096	158,112	2,323,208
Totals	74,347,849	15,218,400	42,898,709	1,826,208	44,724,917

Table 4 continued.

Lake States Area					
State and County or County Group	Bushels of field and fodder corn	Dozen ears of sweet corn	Estimated value of crop in dollars		
			Field and fodder corn	Sweet corn	Total
New York					
Cattaraugus	102,946	100,800	59,400	12,096	71,496
Chautauqua	144,795	300,000	83,547	36,000	119,547
Erie	215,061	1,704,800	124,090	204,576	328,666
Genesee	151,315	545,600	87,309	65,472	152,781
Jefferson	148,399	240,000	85,626	28,800	114,426
Monroe	356,524	1,795,200	205,714	215,424	421,138
Niagara	326,802	416,800	188,565	50,016	238,581
Orleans	180,610	143,200	104,212	17,184	121,396
Oswego	216,918	463,200	125,162	55,584	180,746
Wayne	481,964	562,400	278,093	67,488	345,581
Albany-Fulton-Montgomery-					
Schenectady-Schoharie	578,587	1,121,600	333,845	134,592	468,437
Livingston-Ontario-					
Wyoming	611,181	5,311,200	352,651	637,344	989,995
Totals	3,515,102	12,704,800	2,028,214	1,524,576	3,552,790
Pennsylvania					
Centre	765,491	60,000	441,688	7,200	448,888
Crawford-Erie-Warren	680,901	676,800	392,880	81,216	474,096
Totals	1,446,392	736,800	834,568	88,416	922,984
Totals for Lake States					
Area	110,927,973	35,491,200	64,005,440	4,258,944	68,264,384

Table 4 continued

Eastern States Area, 1935.

State and County or County Group	Bushels of field and fodder corn	Dozen ears of sweet corn	Estimated calue of crop in dollars		
			Field and fodder corn	Sweet corn	Total
<u>Vermont</u>					
Addison-Bennington-					
Rutland	202,966	126,400	117,111	22,752	139,863
Chittenden-Grand Isle-					
Washington	158,199	820,800	91,281	147,744	239,025
Totals	361,165	947,200	208,392	170,496	378,888
<u>Maine</u>					
Oxford	12,823	2,961,600	7,399	533,088	540,487
York	20,674	655,200	11,929	117,936	129,865
Totals	33,497	3,616,800	19,328	651,024	670,352
<u>New Hampshire</u>					
Rockingham-Strafford	51,915	581,600	29,955	104,688	134,643
<u>Massachusetts</u>					
Bristol	48,882	1,191,200	28,205	214,416	242,621
Essex	36,783	892,000	21,224	160,560	181,784
Middlesex	65,477	2,095,200	37,780	377,136	414,916
Barnstable-Norfolk-Plymouth	45,426	680,800	26,211	122,544	148,755
Franklin-Hampden-Hampshire-					
Worcester	399,701	1,792,800	230,627	322,704	553,331
Totals	596,269	6,652,000	344,047	1,197,360	1,541,407
<u>Rhode Island</u>					
Bristol-Newport	64,466	394,400	37,197	70,992	108,189
Kent-Providence-					
Washington	86,701	564,000	50,026	101,520	151,546
Totals	151,167	958,400	87,223	172,512	259,735
<u>Connecticut</u>					
Hartford	266,700	796,800	153,886	135,456	289,342
Middlesex	46,693	150,400	26,942	25,568	52,510
New Haven	95,375	1,550,400	55,031	263,568	318,599
New London	94,859	247,200	54,734	42,024	96,758
Tolland-Windham	124,042	245,600	71,572	41,752	113,324
Totals	627,669	2,990,400	362,165	508,368	870,533

Table 4 continued

Eastern States Area, 1935

State and County or County Group	Bushels of field and fodder corn	Dozen ears of sweet corn	Estimated value of crop in dollars		
			Field and fodder corn	Sweet corn	Total
<u>New York</u>					
Suffolk	219,136	1,654,400	126,441	281,248	407,689
<u>New Jersey</u>					
Monmouth	580,497	3,615,200	334,947	614,584	949,531
Atlantic-Burlington- Ocean	821,604	6,175,200	474,066	1,049,784	1,523,850
Totals	1,402,101	9,790,400	809,013	1,664,368	2,473,381
<u>Maryland</u>					
Wicomico-Worcester	1,648,925	86,400	951,430	14,688	966,118
<u>Virginia</u>					
Accomac-Northampton	1,675,767	24,000	966,918	4,080	970,998
Totals for Eastern States Area	6,817,611	27,301,600	3,904,912	4,768,832	8,673,744
Grand Totals	117,745,584	62,792,800	67,910,352	9,027,776	76,938,128

Table 5. Estimates of damage by the European corn borer to field and fodder corn, and to sweet corn, in counties, and for State regions, surveyed in 1935.

Lake States Area					
State and County or County Group	Average number of borers per 100 plants	Calculated percent loss in		Estimated loss of crop in dollars	
		Field and fodder corn	Sweet corn	Field and fodder corn	Sweet corn
<u>Michigan</u>					
Lenawee	56.4	1.69	4.51	21,315	1,189
Macomb	45.9	1.38	3.67	2,782	1,342
Monroe	42.9	1.29	3.43	13,186	4,653
St.Clair	57.3	1.72	4.58	3,131	853
Washtenaw	19.5	.59	1.56	3,567	1,032
Wayne	7.2	.22	.58	402	1,408
Genesee-Huron-Sanilac-					
Tuscola	142.7	4.28	11.42	43,799	7,926
Hillsdale-Ingham-					
Jackson	16.1	.48	1.29	6,073	836
Lejeer-Livingston-					
Oakland	23.5	.71	1.88	4,137	1,086
Totals				98,392	20,325
					118,717
<u>Indiana</u>					
Adams-Blackford-Jay-Wells	2.3	.07	.18	1,673	25
Allen-DeKalb-Steuben	27.8	.83	2.22	19,164	731
Delaware-Henry-Randolph-					
Wayne	1.2	.04	.10	1,887	47
Huntington-Noble-Whitley	5.9	.18	.47	4,375	40
Totals				27,699	843
					28,542

Table 5 continued.

Lake States Area

State and County or County Group	Average number of borers per 100 plants	Calculated percent loss in		Estimated loss of crop in dollars		
		Field and fodder corn	Sweet corn	Field and fodder corn	Sweet corn	Total
Ohio						
Defiance	4.8	.14	.38	1,152	28	1,180
Fulton	41.0	1.23	3.28	13,130	781	13,911
Hancock	38.8	1.16	3.10	16,610	104	16,714
Henry	44.7	1.34	3.58	19,289	533	19,822
Lucas	121.5	3.65	9.72	19,191	20,239	39,430
Ottawa	25.9	.78	2.07	3,502	173	3,675
Paulding	42.1	1.26	3.37	13,358	414	13,772
Putnam	37.6	1.13	3.01	15,891	113	16,004
Sandusky	48.6	1.46	3.89	15,799	3,843	19,642
Seneca	27.9	.84	2.23	11,446	289	11,735
Williams	9.2	.28	.74	2,052	21	2,073
Wood	91.2	2.74	7.30	56,877	862	57,739
Allen-Auglaize-Mercer-Van Wert	29.2	.88	2.34	38,799	793	39,592
Ashland-Knox-Morrow-Richland	3.8	.11	.30	2,597	71	2,668
Champaign-Darke-Logan-Miami-						
Shelby	12.9	.39	1.03	24,452	801	25,253
Clark-Fayette-Greene-Madison-						
Montgomery	0.5	.02	.04	1,418	216	1,634
Crawford-Wyandot	13.7	.41	1.10	7,297	59	7,352
Delaware-Hardin-Marion-Union	36.3	1.09	2.90	44,927	1,985	46,912
Erie-Huron-Lorain	9.3	.28	.74	3,495	3,784	7,279
Medina-Portage-Stark-Summit-						
Wayne	2.4	.07	.19	1,516	300	1,816
Totals				312,794	55,409	348,203

Table 5 continued.

Lake States Area

State and County or County Group	Average number of borers per 100 plants	Calculated percent loss in		Estimated loss of crop in dollars	
		Field and fodder corn	Sweet corn	Field and fodder corn	Sweet corn
New York					
Cattaraugus	2.1	.06	.17	36	21
Chautauqua	15.7	.47	1.26	393	454
Erie	21.6	.65	1.73	807	3,539
Genesee	3.2	.10	.26	87	170
Jefferson	48.8	1.46	3.90	1,250	1,123
Monroe	26.5	.80	2.12	1,646	4,567
Niagara	5.9	.18	.47	339	235
Orleans	8.2	.25	.66	261	113
Oswego	40.9	1.23	3.27	1,539	1,818
Wayne	17.5	.53	1.40	1,474	945
Albany-Fulton-Montgomery- Schenectady-Schoharie	48.1	1.44	3.85	4,807	5,182
Livingston-Ontario- Wyoming	3.5	.11	.28	388	1,785
Totals				13,027	19,952
Pennsylvania					
Centre	22.5	.68	1.80	3,003	130
Crawford-Erie-Warren	1.0	.03	.08	118	65
Totals				3,121	195
Totals for Lake States Area				455,033	76,724
					531,757

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Table 5 continued.

Eastern States area

State and County or County Group	Average number of borers per 100 plants	Calculated percent loss in		Estimated loss of crop in dollars		
		Field and fodder corn	Sweet corn	Field and fodder corn	Sweet corn	Total
Vermont						
Addison-Bennington-Rutland	27.4	.82	2.19	960	498	1,458
Chittenden-Grand Isle-Washington	37.2	1.12	2.98	1,022	4,403	5,425
Totals				1,982	4,901	6,883
Maine						
Oxford	2.5	.08	.20	6	1,066	1,072
York	10.4	.31	.83	37	979	1,016
Totals				43	2,045	2,088
New Hampshire						
Rockingham-Strafford	72.6	2.18	5.81	653	6,082	6,735
Massachusetts						
Bristol	86.1	2.58	6.89	728	14,773	15,501
Essex	200.5	6.02	16.04	1,278	25,754	27,032
Middlesex	303.9	9.12	24.31	3,446	91,682	95,128
Barnstable-Norfolk-Plymouth	259.8	7.79	20.78	2,042	25,465	27,507
Franklin-Hampden-Hampshire-						
Worcester	20.5	.62	1.64	1,430	5,292	6,722
Totals				8,924	162,966	171,890
Rhode Island						
Bristol-Newport	150.1	4.50	12.01	1,674	8,526	10,200
Kent-Providence-Washington	71.5	2.15	5.72	1,076	5,807	6,883
Totals				2,750	14,333	17,083

Table 5 continued.

Eastern States Area

State and County or County Group	Average number of borers per 100 plants	Calculated percent loss in	Estimated loss of crop in dollars		
			Field and fodder Corn	Sweet corn	Total
Connecticut					
Hartford	721.4	21.64	33,301	78,172	111,473
Middlesex	415.8	12.47	3,360	8,504	11,864
New Haven	459.2	14.08	7,748	98,943	106,691
New London	44.7	1.34	733	1,504	2,237
Tolland-Windham	35.0	1.05	752	1,169	1,921
Totals			45,894	188,292	234,186
New York					
Suffolk	95.0	17.85	22,570	133,874	156,444
New Jersey					
Monmouth	43.4	1.30	4,354	21,326	25,680
Atlantic-Burlington-Ocean	33.3	1.00	4,741	27,924	32,665
Totals			9,095	49,250	58,345
Maryland					
Wicomico-Worcester	9.4	.28	2,664	110	2,774
Virginia					
Accomac-Norhampton	18.1	.54	5,221	59	5,280
Totals for Eastern States Area			99,796	561,912	661,708
Grand Totals			554,829	638,636	1,193,465

Table 6. Estimates of damage caused by the European corn borer to field and fodder corn, and to sweet corn, in comparable territory in 1932, 1933, 1934, and 1935.

Acreage	Estimated value of crop in dollars					Estimated loss of crop in dollars				
	1932	1933	1934	1935		1932	1933	1934	1935	
<u>Lake States area*</u>										
Field and fodder corn	1,428,780	15,758,257	25,881,418	40,436,281	28,592,811	183,700	255,875	179,320	313,964	
Sweet corn	24,127	1,999,088	2,350,324	2,308,312	2,316,192	85,789	69,198	38,094	57,288	
Total	1,452,907	17,757,345	28,231,742	42,744,593	31,909,003	269,489	325,073	217,414	371,252	
<u>Eastern States area**</u>										
Field and fodder corn	20,001	298,401	489,829	765,710	541,440	14,627	41,578	41,320	74,838	
Sweet corn	11,215	1,220,190	1,435,520	1,525,240	1,570,968	168,743	298,340	241,562	461,732	
Total	31,216	1,518,591	1,925,349	2,290,950	2,112,408	183,370	339,918	282,882	536,570	
<u>Both areas</u>										
Field and fodder corn	1,448,781	16,056,658	26,371,247	41,201,991	29,134,251	198,327	297,453	220,640	388,802	
Sweet corn	35,342	3,219,278	3,785,844	3,833,552	3,887,160	254,532	367,538	279,656	519,020	
Grand total	1,484,123	19,275,936	30,157,091	45,035,543	33,021,411	452,859	664,991	500,296	907,822	

* Comprises the following comparable counties and county groups: Lenawee, Macomb, Monroe, St. Clair, Washtenaw, Wayne, and Lapeer-Livingston-Oakland in Michigan; Allen-DeKalb-Steuben in Indiana; Defiance, Fulton, Hancock, Henry, Lucas, Ottawa, Paulding, Putnam, Sandusky, Seneca, Williams, Wood, Allen-Auglaize-Van Wert-Mercer, Crawford-Wyandot, and Erie-Huron-Lorain in Ohio; and Chautauqua, Erie, Genesee, Jefferson, Monroe, Niagara, Orleans, Oswego, and Wayne in New York.

** Comprises the following comparable counties and county groups: Bristol, Essex, and Middlesex in Massachusetts; Newport-Bristol in Rhode Island; Hartford, Middlesex, New Haven, and New London in Connecticut; and Suffolk in New York.

